The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte CHRISTOPHER HUGH STROLLE

Appeal No. 2006-0401
Application 08/869,589[1]

ON BRIEF

Before THOMAS, BARRETT, and DIXON, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) from the final rejection of claims 1, 9, 10, 12, 15, and 16. Claims 2-8, 11, 13, and 14 are allowed.[2]

We affirm.

[1] Application for patent filed June 5, 1997, entitled "Method and Apparatus for Performing Bandedge Equalization," which is based on and claims priority under 35 U.S.C. § 119(e)(1) from U.S. Provisional Application 60/019,308, filed June 7, 1996.

[2] Claim 8 should be objected to since it depends from rejected independent claim 1.

PRIOR DECISION

A prior decision (pages referred to as "D__") was entered on February 11, 2004, in this application by Appeal No. 2002-1376. The decision affirmed the anticipation rejection of claims 1, 9, 10, 12, 15, and 16. This decision is incorporated-by-reference.

BACKGROUND

The invention relates to a method and apparatus for performing equalization of the amplitudes of the bandedges of a broadband signal. The equalization of the amplitudes of the bandedges allows a bandedge timing recovery circuit to produce substantially jitter-free or stress-free timing signals.

Claims 1 and 12 are reproduced below, where the underlining indicates limitations added after the prior decision.

> 1. Apparatus for equalizing the amplitudes of the bandedges of a broadband signal comprising:
>
> a pre-equalizer for adjusting the amplitudes of the bandedges of said broadband signal in response to a control signal <u>such that the amplitudes of the bandedges are made equal</u>;
>
> a bandedge filter, connected to said pre-equalizer, for extracting a bandedge signal from said broadband signal; and
>
> a bandedge signal processor, connected to said bandedge filter, for generating said control signal in response to said bandedge signal.

12. A method of equalizing the amplitudes of the bandedges of a broadband signal comprising the steps of:

adjusting the amplitudes of the bandedges of said broadband signal in response to a control signal <u>such that the amplitudes of the bandedges are made equal</u>;

extracting a bandedge signal from said broadband signal; and

generating said control signal in response to said bandedge signal.

THE REFERENCE

The examiner relies on the following reference:

Norrell et al. (Norrell)	5,793,821	August 11, 1998 (filed June 7, 1995)

THE REJECTION

Claims 1, 9, 10, 12, 15, and 16 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Norrell.

We refer to the final rejection (pages referred to as "FR__") entered April 27, 2004, and the refiled examiner's answer (pages referred to as "EA__") entered July 8, 2005, for a statement of the examiner's rejection, and to the appeal brief (pages referred to as "Br__") filed September 29, 2004, and the reply brief (pages referred to as "RBr__") filed February 22, 2005, (and refiled September 8, 2005) for a statement of appellant's arguments thereagainst.

OPINION

Claims 1 and 12

In our previous decision, which we incorporate-by-reference, we found that Norrell discloses "adjusting the amplitudes of the bandedges of said broadband signal in response to a control signal" (claims 1 and 12) because it discloses adaptive equalization to compensate for amplitude and phase distortion at the bandedges (col. 2, lines 10-16):

> [T]he power envelope of a signal can be adversely affected by channel impairments, particularly amplitude and phase distortion at the band edges. To compensate for such impairments, many receiver designs include an adaptive equalizer which compensates for amplitude and phase distortion on the transmission channel in the data recovery path. (Emphasis added.)

See D6. That is, channel frequency response deviates from the ideal of constant amplitude and linear phase (constant delay) and "equalization" compensates for these nonideal characteristics by filtering before further processing is done. An "adaptive equalizer" is one that uses feedback to control the equalization. Norrell teaches adaptive equalization to compensate for amplitude and phase distortion at the bandedges and adaptive equalization adjusts the amplitude and phase in response to a control signal. Norrell is primarily concerned with compensating for delay (phase) distortion, but states that the embodiment "also advantageously compensates for the effects of amplitude distortion on the communications channel" (col. 7, line 67, to

col. 8, line 2) and shows an adaptive equalizer as delay line 506 in Fig. 5 (col. 9, lines 34-36) which is "long enough to compensate for amplitude and delay distortion in general" (col. 9, lines 45-46). Norrell discloses that "[prior art] equalization boosts the desired energy at the bandedges, but also boosts the unwanted energy near the bandedges" (emphasis added) (col. 9, lines 14-16), which teaches amplifying at the bandedges for equalizaiton (D6-7). In our previous decision, we stated that "[a]mplitude equalization means attenuating or amplifying to make the amplitudes equal" (D8).

In response to our previous decision, appellant amended independent claim 1 to recite "a pre-equalizer for adjusting the amplitudes of the bandedges of said broadband signal in response to a control signal <u>such that the amplitudes of the bandedges are made equal</u>" (underlining indicates amendment) and amended claim 12 to recited "adjusting the amplitudes of the bandedges of said broadband signal in response to a control signal <u>such that the amplitudes of the bandedges are made equal</u>" (underlining indicates amendment). The examiner relies on our statement that "[a]mplitude equalization means attenuating or amplifying to make the amplitudes equal" (D8) to meet the new limitations (EA11).

Appellant argues that Norrell does not specifically teach that the bandedges are to have equal amplitudes (Br13; RBr2). It is argued that the equalizer delay line 506 at Fig. 5 implements

a time delay and the filter 504 and delay line 506 "merely compensate for differential delay distortion between the upper and lower bandedges" (emphasis omitted) (Br15). It is argued that compensation of time delay differences between the upper and lower bandedge frequencies is devoid of any teaching of adjusting the amplitudes of bandedges to make the bandedges equal (Br15-16). Appellant points out where Norrell discusses compensating for delay distortion, and argues that this is not amplitude distortion (Br16). It is argued that to the extent Norrell compensates for amplitude distortion, Norrell merely passes the energy in the regions centered at the lower and upper bandedges and does not teach a control signal to actively adjust the amplitudes of the bandedges (Br16). It is argued that once the delay distortion is compensated for in the delay line, the Lower Band Edge Filter (LBEF) and Upper Band Edge Filter (UBEF) perform amplitude compensation by attenuating the region between the lower and upper bandedges, which does not adjust the amplitudes such that the amplitudes of the bandedges are made equal (Br17). Appellant argues (Br17; RBr2-3):

> The cited section (Norrell, column 9, lines 11-15) is directed to <u>channel equalization</u> and **<u>not</u>** the specific adjustment of bandedges of a broadband signal <u>in response to a control signal such that the amplitudes of the bandedges are made equal</u>. Channel equalization generally involves equalization of the <u>entire frequency response</u> and, as such, is **<u>not</u>** the same as adjusting bandedges such that the amplitudes of the bandedges are made equal. The purpose of the cited section was to clarify the advantage of sharply attenuating the midband, i.e., the region between the LBEF

> and the UBEF, in Norrell. Moreover, the cited section is <u>devoid</u> of any teaching of an adjustment of bandedges to make them have equal amplitude <u>in response to a control signal, as generated by the bandedge filter and bandedge signal processor in Appellant's invention</u>. Thus, the cited section does **<u>not</u>** teach the adjusting of amplitudes of the bandedges of a broadband signal such that the amplitudes of the bandedges are made equal as in claim 1 of Appellant's invention.

It is argued that "Norrell teaches adjusting of the amplitude of the original signal, including the bandedges but nowhere does it teach specifically making the bandedge amplitudes equal" (Br18).

It is true that Norrell does not expressly state that the amplitudes of the bandedges are made equal. Nevertheless, Norrell discloses adaptive equalization to compensate for amplitude and phase distortion at the bandedges (col. 2, lines 10-16), which implies that the amplitudes are made equal to correct for amplitude distortion in the channel. Although Norrell is concerned with delay distortion, it expressly states that it also compensates for the effects of amplitude distortion (col. 7, line 67, to col. 8, line 2; col. 9, lines 1-16 & 44-46). Norrell uses an adaptive equalizer (filter 504 and delay line 506) and the adjusting of amplitudes <u>and</u> delay (not just delay as argued by appellant) is done by adjusting the coefficients to the filter 504 which control the equalizer. We disagree with appellant's statement that Norrell is limited to channel equalization: since the coefficients are based on the outputs from the LBEF and UBEF, the amplitude and delay

equalization are based on the bandedge signals. In our opinion, Norrell's teachings of bandedge amplitude equalization implies that making the amplitudes of the bandedges equal is inherent. Appellant does not point out the error in our statement that "[a]mplitude equalization means attenuating or amplifying to make the amplitudes equal" (D8) by providing any arguments, explanation, or evidence, such as dictionary definitions, book descriptions of amplitude equalization, Rule 132 declarations of what Norrell teaches one skilled in the art, etc., but merely argues that Norrell does not expressly state that the amplitudes of the bandedges are made equal. Therefore, appellant leaves it us to make a technical determination that the amplitude compensation in Norrell does not inherently adjust the amplitudes of the bandedges to be equal without providing any evidence. Appellant takes no risk of making an argument that might be wrong. If appellant had argued that the Norrell's teaching of amplitude equalization of bandedges does not make the amplitudes equal, and provided some explanation and evidence, instead of just arguing that Norrell does not expressly teach making the amplitudes equal, this would be a different situation.

To the extent that appellant relies on the limitation of a "broadband signal," this term is not defined and appellant has not argued how the term distinguishes over the signal in Norrell.

Appellant argues that Norrell does not teach a pre-equalizer for making the amplitudes of the bandedges equal as recited in claim 1 (Br14).

Claim 1 does not recite that the "pre-equalizer" is an equalizer functionally placed before ("pre-") an "equalizer" and such a limitation will not be implied. The term "pre-equalizer" is just a name unless it is defined by other structure or functional relationships. The filter 504 and delay line 506 perform the recited function of the "pre-equalizer" and, therefore, are considered to be a "pre-equalizer."

For the reasons stated above, we affirm the anticipation rejection of claims 1 and 12.

Claims 9, 10, 15, and 16

The adaptive equalizer in Norrell compensates for amplitude (and delay) distortion and we find that this implies inherently making the amplitudes of the bandedges equal. Appellant has not explained why this is not true or provided any evidence to the contrary, but merely argues that it is not expressly disclosed, and so has not shown error in our finding. If the amplitudes of bandedges are made equal, this must be done by attenuating one bandedge to bring it down to the level of the other bandedge as recited in claims 9 and 15, or by amplifying one of the bandedges to bring it up to the level of the other as recited in claims 10 and 16, or, more likely, by a combination of attenuation and

amplification. The anticipation rejection of claims 9, 10, 15, and 16 is affirmed.

CONCLUSION

The rejection of claims 1, 9, 10, 12, 15, and 16 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv).

AFFIRMED

JAMES D. THOMAS Administrative Patent Judge	)	
LEE E. BARRETT Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JOSEPH L. DIXON Administrative Patent Judge	)	

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